

**The Status of Mahogany Mistletoe
(*Phoradendron rubrum* (L.) Grisebach)
on Sands Key, Biscayne National Park**

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to
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Background:

On December 18, 2002 while conducting a survey for semaphore cactus (*Opuntia corallicola*) on Sands Key, Biscayne National Park, mahogany mistletoe (*Phoradendron rubrum*) was found on two mahogany trees (*Swietenia mahagoni*) by the author. Mahogany mistletoe is listed as endangered by the State of Florida and as critically imperiled in South Florida by The Institute for Regional Conservation and in Florida by the Florida Natural Areas Inventory (Gann et al. 2002).

The global range of this mistletoe includes Florida, the Bahamas, the Cayman Islands, Cuba, Hispaniola, and Puerto Rico. It has been reported as a semi-parasitic shrub primarily on mahogany, but also on *Byrsonima lucida*, *Guapira discolor*, and *Mangifera indica* (Kuijt 2003). The parasitic shrub was formerly known with certainty in Florida only from Key Largo (Gann et al. 2002, Kuijt 2003). In the early 1960s Frank Craighead reported observing the species on Key Largo while conducting low elevation flights, but also reported that he believed he saw plants on Sands and Old Rhodes Keys, but this was never verified (Cooley 1963).

In December 2002, the species was known from only two mahogany trees at the Key Largo Hammocks State Botanical Site, and those trees were in a state of decline (Gann 2000). The host trees later died and none of the original mistletoe plants remain there. Efforts to augment the population at Key Largo Hammocks by Janice Duquesnel of the Florida Park Service have so far been successful. Planting of seeds on mahogany trees at three locations in that park have resulted a current population of 32 seedlings (personal communication). Duquesnel has also been successful in reintroducing the species to the southern end of Key Largo, having had seedlings germinate at Dove Creek Hammocks, Florida Keys Wildlife and Environmental Area. There are now four seedlings at this preserve. These seedlings have proven to be very slow growing.

Methods and Results:

Two biologists surveyed the ca. 71 acre rockland hammock on Sands Key. Each surveyor walked straight, parallel transects roughly 10-20 meters apart, visiting each mahogany tree that was seen. In areas where the hammocks was poorly developed and no mahogany trees were present, transects were placed roughly 40 meters apart.

The canopy of each mahogany tree was inspected from the ground. The survey was completed in three days. Each tree that was found to have mistletoe was marked with pink flagging tape and a numbered aluminum tag, attached to the tree by wrapping a galvanized steel wire loosely around the trunk. For each tree with mistletoe, GPS coordinates were collected, the number of mistletoe plants was estimated, and the DBH of the tree was measured.

Surveys were conducted on three days: July 22, July 30, and August 10, 2004. Four mahogany trees supporting mistletoe were observed, including the two trees seen in 2002 (Table 1, Figure 1). Sixty-one mistletoe clumps were counted on the four trees, with individuals trees having 7 to 28 clumps. One host tree was found on the southern edge of the hammock, adjacent to tidal swamp, with another host tree about 25 meters deeper into the center of the hammock. The two other trees were in the center of the hammock, about 55 meters from the tidal swamp. Three of the trees appeared healthy, while the other (tag number 4000), was in poor health.

Mahogany trees were not common on Sands Key. At least half of the island had almost no mahogany trees, including the entire northwestern end west of the westernmost host trees. Mahogany was observed to be occasional in the center of the island where all four host trees occur. There are only an estimated 50-100 adult mahogany trees on the island. Several large dead mahogany trees were also observed, having fallen in past storms. As part of a separate project, two 250 m transects were placed in the eastern portion of the hammock. Mahogany was recorded as intercepting only one of the transects but did not occur at any of 50 intercept points placed at 2.5 meter intervals along the transect (The Institute for Regional Conservation, unpublished data).

Table 1:

| Tag Number | Easting ¹ | Northing | Number of Plants | DBH (cm) |
|------------|----------------------|----------|------------------|----------|
| 3800 | | | 7 | 63.3 |
| 3997 | | | 17 | 17.5 |
| 3999 | | | 28 | 50.3 |
| 4000 | | | 9 | 32.8 |

Discussion:

Mahogany mistletoe is not as common on Sands Key as had been hoped. Only four host mahogany trees were found, supporting sixty-one clumps. Because of the limited amount of mahogany on Sands Key, the population will most likely remain small in perpetuity.

Surveys should also be conducted on other islands that support populations of mahogany, including Old Rhodes Key, Swan Key, the Totten Keys, and Elliott Key. Because of the history of agricultural clearing on Elliott Key, surveys on this island should be a lower priority.

It is likely that mahogany mistletoe once occurred on several islands between Sands Key and Key Largo. Several of these islands, especially Elliott Key and Adams Key have undergone extensive clearing for farming and other activities, losing most of their original forest cover. If mistletoe was present at one time, it was probably extirpated on these islands with the cutting of its host trees. Augmentation work on Key Largo that is being conducted by Janice Duquesnel is showing positive results. Seeds placed on branches of mahogany trees by hand can germinate (Gann 2000, Campbell 1995). Indeed, her efforts on Key Largo prevented its extirpation there. Reintroduction to Elliott Key and other islands of Biscayne National Park may be warranted if no additional population are found. If this is done, germplasm from both the Sands Key and Key Largo populations should be used. Fairchild Tropical Botanical Garden maintains an ex-situ collection of mistletoe from Key Largo, and this would be an excellent source for use on Elliott Key or on other islands.

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¹ UTM zone 17, WGS84.

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